

जलसंपदा विभागातील नवीन नियुक्त होणाऱ्या स.अ.श्रेणी-२
(विद्युत) यांच्याकरिता प्रशिक्षण कार्यक्रम.

महाराष्ट्र शासन

जलसंपदा विभाग

शासन परिपत्रक क्रमांक : संकीर्ण २०१५/प्र.क्र.१७४/१५/जवि,

नवीन प्रशासकीय इमारत, ६ वा मजला, मंत्रालय,

मादाम कामा मार्ग, हुतात्मा राजगुरु चौक, मुंबई ४०० ०३२.

दि. ०७ जून, २०२१.

वाचा : शासन परिपत्रक क्र. संकीर्ण २०१५/प्र.क्र.१७४/१५/जवि, दि.०५.१२.२०१५

परिपत्रक

प्रस्तावना -

जलसंपदा विभागातील नवीन नियुक्त होणा-या सहायक अभियंता- श्रेणी-२ (विद्युत) यांच्या करिता उपरोक्त दि.५.१२.२०१५ रोजीच्या परिपत्रकान्वये ५२ आठवड्यांच्या प्रशिक्षण कार्यक्रम आखण्यात आला आहे. लाक्षेवि (आस्था) कार्यासन, जलसंपदा विभाग यांनी दि.१८.०३.२०१७ रोजीच्या परिपत्रकान्वये सहायक अभियंता-श्रेणी-२ (स्थापत्य) यांचेकरिता सदर प्रशिक्षण कार्यक्रमाचा कालावधी १६ आठवडे केला असून, त्याच धर्तीवर सहायक अभियंता- श्रेणी-२ (विद्युत) यांच्या करिताचा प्रशिक्षण कालावधी १६ आठवडे करणे व ऑनलाईन प्रशिक्षण कार्यक्रमाचा आराखडा मेटाशी परस्पर समन्वय साधून नव्याने निश्चित करणे ही बाब शासनाच्या विचाराधीन होती. या अनुषंगाने सदर प्रशिक्षण कार्यक्रम खालीलप्रमाणे सुधारित करण्यात येत आहे.:-

अ.क्र.	विषयाचे विवरण	संकेतांक	कालावधी
१	प्राथमिक प्रशिक्षण : जलसंपदा विभागाची ओळख, संघटना तक्ता, सर्वसाधारण कार्यालयीन कामकाज पद्धती, अधिनियम, नियम, महाराष्ट्र सा.बां.नियम पुस्तिका, महाराष्ट्र नागरी सेवा नियम, माहितीचा अधिकार व इतर प्रशासकीय नियम/कायदे.	BT	२ आठवडे
२	पारंपारिक जलविद्युत परियोजना, सर्व्हेक्षण व अन्वेषण व प्रकल्प अहवाल तयार करणे, जलवहन यंत्रणा, टरबाईन व जनरेटर व अनुषंगिक सामग्री, जलविद्युत प्रकल्पाशी संबंधित स्थापत्य व यांत्रिकी विभागांतर्गत अंतर्भूत यंत्रणांची माहिती इत्यादी.	CHPP	२ आठवडे
३	उदंचन जलविद्युत योजनेचे विविध घटक व क्षमता ठरविणे, नियंत्रण आणि संरक्षण प्रणाली स्थापत्य व यांत्रिकी शाखेतील परस्पर समन्वय इत्यादी.	PSS	२ आठवडे
४	उपसा सिंचन योजना सर्वसाधारण माहिती, पंपहाऊस आराखडा व कळयंत्र आवार, उपसा सिंचन योजनांचे विद्युत घटक व यांत्रिकी घटक यांची माहिती तसेच योजनेच्या परिचालन विषयक माहिती इत्यादी	LIS	२ आठवडे
५	लहान जविप्र व त्याचे मान्सून पूर्व व पश्चात निरीक्षण लहान जविप्र खाजगीकरण धोरण व प्रकल्प विकसन करण्याची प्रक्रिया, इत्यादी	SHP	१आठवडा
६	वातानुकूलन, अग्निशमन यंत्रणा व इतर : विद्युतगृहांचे वातानुकूलन, अग्निशमन, उदवाहन, विद्युतीकरणे, सौर ऊर्जा नियोजन, विद्युत निर्मिती अंदाज, नियम आणि विनियम, संरचना इ.	AC/FF	२ आठवडे

७	Indian Electricity Act and Rules (कायदा व नियम)	IE	१आठवडा
८	ई निविदा प्रक्रिया, प्रकल्प अहवाल तयार करणे व त्यास प्रशासकीय मान्यता कार्यवाहीबाबत माहिती, ई निविदा प्रक्रिया, निविदा करार मोजमापे नोंदविणे इत्यादी.		१आठवडा
९	गुणवत्ता वाढविणे, नितीशास्त्र, तत्वे, तणाव व्यवस्थापन	EM	१आठवडा
१०	ई जलसेवा अभ्यास (ई गव्हर्नन्स)	EJ	१आठवडा
११	जलविद्युत प्रकल्प/ उपसा सिंचन प्रकल्प / उदंचन योजना प्रकल्प स्थळी भेटी देणे	SV	१आठवडा
	प्रशिक्षणाचा एकूण कालावधी		१६ आठवडे

सदर प्रशिक्षण कार्यक्रमांतर्गत प्रकल्पभेटी या एक (१) आठवडा प्रकल्पस्थळी वास्तव्य अशा स्वरूपाच्या असतील. प्रकल्प भेटीनंतर या प्रकल्पावरील विद्युत अभियंत्याच्या जबाबदाऱ्याबाबत प्रशिक्षणार्थींनी अभ्यास अहवाल सादर करावा.

१.० मेटा, नाशिक येथील व्यावसायिक प्रशिक्षण अभ्यासक्रमाची विषयसूची सोबत जोडलेल्या विवरणपत्रात आहे. सदर प्रशिक्षण मेटा, नाशिक यांनी ऑनलाईन पद्धतीने आयोजित करावयाचे आहे. उपरोक्त प्रशिक्षण कालावधीत प्रशिक्षणार्थींनी प्रत्येक दिवशी त्या दिवसाची दैनंदिनी ऑनलाईन सादर करणे आवश्यक राहिल.

२.० प्रत्येक प्रशिक्षण Module यशस्वीरित्या पूर्ण केल्याचे प्रमाणपत्र मेटा मार्फत प्रशिक्षणार्थींना देण्यात यावे.

३.० सदर प्रशिक्षणाचा खर्च महाराष्ट्र अभियांत्रिकी प्रशिक्षण प्रबोधिनी, नाशिक यांनी जलसंपदा विभागाकडून प्राप्त होणा-या अनुदानातून भागवावा.

सदर शासन परिपत्रक महाराष्ट्र शासनाच्या www.maharashtra.gov.in या संकेतस्थळावर उपलब्ध करण्यात आले असून, त्याचा संगणक संकेतांक २०२१०६०७१७३६२५२२२७ असा आहे. हे परिपत्रक डिजीटल स्वाक्षरीने साक्षांकित करून काढण्यात येत आहे.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नांवाने

सोबत : परिशिष्ट १, २.

(र. रा. शुक्ला)
शासनाचे उप सचिव

प्रति :-

१. प्रधान सचिव (जलसंपदा), जलसंपदा विभाग, मंत्रालय, मुंबई.
२. सचिव (जसंव्य व लाक्षेवि), जलसंपदा विभाग, मंत्रालय, मुंबई.
३. सर्व कार्यकारी संचालक व महासंचालक, जलसंपदा विभाग,
४. मुख्य अभियंता (विद्युत), जलविद्युत प्रकल्प, मुंबई
५. सर्व मुख्य अभियंता, जलसंपदा विभाग,
६. सर्व मुख्य अभियंता व सह सचिव, जलसंपदा विभाग, मंत्रालय, मुंबई
७. उप सचिव (सेवा), जलसंपदा विभाग, मंत्रालय, मुंबई
८. उप सचिव (प्रशा), जलसंपदा विभाग, मंत्रालय, मुंबई
९. उप सचिव (जवि), जलसंपदा विभाग, मंत्रालय, मुंबई

- १०.सर्व अधीक्षक अभियंता, जलसंपदा विभाग,
- ११.कक्ष अधिकारी, आ (प्रशि) कार्यासन, जलसंपदा विभाग, मंत्रालय, मुंबई.
- १२.कक्ष अधिकारी, सअ श्रेणी-२ कार्यासन, जलसंपदा विभाग, मंत्रालय, मुंबई.
- १३.जलविद्युत कार्यासन संग्रहार्थ.

परिशिष्ट १

Training program for direct recruited AEII (Electrical)

Sr no.	Subject Description	code	period
A.	Basic Training-	BT	२ week
	<ul style="list-style-type: none"> WRD Organization, Rules and Responsibility. Acts, Rules, MPW Manual. MCSR, RTI etc. 		
B	Conventional Hydro Power project.	CHPP	२ week
	<ul style="list-style-type: none"> Scheme Component Survey & Investigation and preparation of Project report Water conductor system Turbine & Generator plant Embedment, Foundation, erection sequence etc. Interrelated activities of Civil & Mechanical Wing Operation & Maintenance, etc. 		
C	Pumped Storage Scheme	PSS	२ week
	<ul style="list-style-type: none"> Layout Various component & capacity deciding etc. Different Transformers ACLT , DC, Battery etc. Control & protection system Power & control cable Interrelated activities of Civil & Mechanical Wing Operation & Maintenance, etc. 		
D	Lift Irrigation Scheme	LIS	२ week
	<ul style="list-style-type: none"> Fundamentals Layout of power house & switchyard Component & capacity deciding Interrelated activities of Civil & Mechanical Wing Operation & Maintenance, etc. Switchgear for LIS etc. Earthmat design & its requirement etc. 		

E	Small Hydro Project & its inspection (Pre/Post monsoon inspection)	SHP	9 week
	<ul style="list-style-type: none"> • Scenario of SHP • Privatisation Policy • Inspection • Instrumentation of Dam etc. 		
F	Air conditioning, Fire fighting system etc.	AC/FF	2 week
	<ul style="list-style-type: none"> • Air conditioning of PSS/PH • Fire fighting of PSS/PH • Lift for PSS/PH • Illumination (AC/DC) of PSS/PH • Solar \oint planning, Power estimation, rules regulation, layout etc. 		
G	IE Rules	IE	9 week
	<ul style="list-style-type: none"> • IE rules • Electricity act • Fire, Insurance, accident etc. 		
H	E tendering , Estimate etc.		9 week
	<ul style="list-style-type: none"> • Project Report • Administrative Approval • Tendering, E tendering • Contract & its procedure • MB recording etc. 		
I	Value education, ethics and moral, stress management	EM	9 week
J	E- jalseva, E- Governance	EJ	9 week
K	Site Visit	SV	9 week
	<ul style="list-style-type: none"> • Visit to SHPs, HEPs, PSS, LIS etc. 		
	Total		98 week

परिशिष्ट २

Detail Training program for direct recruited AEII (Electrical)

A) Basic Training-२ week
<p>१) Introduction, working and set up of WRD, Organizational hierarchy: Mantralaya, Regional heads, CE, SE, EE etc., Various Institutions, MERI, CDO, META, WALMI etc.</p> <p>२) Work under Hydro organisation.</p> <p>३) Nature of works to be executed by WRD eg. Hydro Projects, Lift Irrigation Scheme etc. Source of funding to Dept. & their distributions at various levels, Responsibilities of various Officers from Secretary to DE level, Specifically duties of Officer in charge.</p> <p>४) Office Procedures.</p> <p>५) Financial Institutions, MNRE, REC- funding procedure & their accounting procedure.</p> <p>६) Maharashtra Public Works account code, Accounting procedure of WRD & corporations, Budget, LOC/Non LOC, MOF of BEAMS (BDS), Imprest account and temporary advance to JE/AEII. Cash & cash account, Audit paras & their reply, Public Account Committee. MPW manual & important provisions there in.</p> <p>७) M.C.S.R rules १९८१, Conduct rules & regulations, Disciplinary authority, Joining time, T A bills, ETA bills, pay leave rules etc.</p> <p>८) Various types of establishment, professional exam, Maharashtra discipline & appeal rule १९७९, Dismissal & removal, suspension & payment during suspension. GPF, GIS, GPF loan, recovery of loan, Housing loan, Computer loan, vehicle loan to GOVT Employee and their recovery</p> <p>९) Appointment of Information Officer and his duties, introduction of Right to Information Act २००५, Various provisions & operations, Procedure of giving Replies, Penalty for delays in replies, case study of RTI ACT, prevention and action to be taken.</p> <p>१०) Departmental enquiry procedure, Penalties & punishment, Maharashtra administrative tribunal act १९८५, confidential report its important in service and communicating the CR.</p> <p>११) Introduction to effective office management, challenges in office management.</p> <p>१२) Information & record management, destruction of old record rules</p>

B) Conventional Hydro Power project.—2 week

1) Conventional Hydro Power schemes.

2) Components of Hydro Power Projects.

3) Planning of Hydro Project, Preliminary survey, Collection of field data, Preparing Scrutinizing estimates, Preparation of Project Report.

Confirmation of hydraulic data, installed capacity

4) Survey Investigation & preparation of Project report.

5) Different types of Turbines. Selection of the Turbines. Construction details of Turbines & its associated auxiliaries. ETC & Operation and Maintenance of Turbine.

6) Different types of Valves, Selection/ Capacity of the Main Inlet Valve (MIV)/ BFV/ spherical valve/Draft Tube gate/ valve, etc., Construction details of Valves, ETC & operation and Maintenance of Valves.

7) Water Conductor system– Intake gates/trash rack/penstock/surge/tailrace/DT gate/trash rack/MIV/BFV/spherical valve/Bye pass valve.

Transient / Surge analysis

8) Different types of Generator, Selection of the Generator. Construction details of Generator & its associated auxiliaries. ETC & Operation and Maintenance of Generator.

Confirmation of Turbine – generator data with respect to civil construction power house.

9) Schematic diagram of governing system, required Instrumentation for governing system, Guide Vane operation, ETC and O & M of the above, All Safety Devices for main T /G.

10) Planning of stage wise concreting b) Embedment for electromechanical equipment c) Foundation of electromechanical equipment d) Erection sequence e) Special Erection Tools & Tackles f) Supervisory aspect during construction g) setting testing of mechanical components

11) Interrelated activities of Civil & Mechanical wing & Operation & Maintenance etc.

C) Pumped storage Hydro Power schemes.—2 week

1) General Layout of Power House.

३) Power evacuation, Design of E & M Equipments of Hydro Projects.

३) Selection / Capacity of EOT crane, Construction details of the EOT Crane ETC and O & M of the EOT Crane.

४) Details of SFC (Static Frequency Convertor) ETC of the SFC.

५) Different Types/ Selection/ Capacity of the Power Transformer, Construction details of Power Transformer, Protection system for Power Transformer, ETC and operation and maintenance of Power Transformer.

६) Different Types / Selection Capacity of the UAT/ SAT, Construction details of UAT/ SAT, Protection System for UAT/ SAT, ETC and operation and maintenance of UAT/ SAT.

७) Design of A CLT & DC Distribution system, Battery, Battery Charger& D G set ETC and O & M.

८) Control and protection system for T/ G plant, SCADA system.

Fundamental & needs of control & Protection system, Various types of control devices, Various types of protective devices , Designs of scheme vis-a §vis Schematic Diagram, Function and operation of various protective relay and maintenance.

९) Selection /Size of H T Power Cables, L.T. power and Control cables, study of schematic diagram, cable schedules, cable termination for overall control and Protection system of power house & switchyard.

१०)Cooling Water system, Drainage & Dewatering, Compressed Air System & Air Handling Unit (AHU), OPU, Oil system.

११) Interrelated activities of Civil & Mechanical wing & Operation & Maintenance etc.

D) Lift Irrigation Scheme – २ week

१) Fundamentals of Lift Irrigation Scheme. General Layout of LIS.

२)Design of load requirements for Pumping machinery Transformer capacity, cables & other Electrical equipments, fault MVA, selection of switchgear, power supply line.

3) Fundamental of electrical switchgear b) Switchgear organization structure c) Process of workflow d) Designing of L.V. panels/ MCB e) Designing of SMDB f) Designing of DB g) Designing of capacitor bank h) Designing of DOL starter i) Designing of Star delta starter j) Designing of control panel using VFD starter k) Designing of control panel using soft starter l) Production of all panels Testing commissioning of panels m) Operation & maintenance of LT panels

8) Design & Erection of Mechanical Equipments.

9) Layout of switchyard.

6) Layout of switchyard / Different Types of (AIS/GIS) switchyard, Selection/ Capacity of switch yard equipment viz. CB, CT, PT ISO, LA, BUS BAR equipments, Selection of bus bar system, Control and Protection system for switchyard, Fault level calculation and proactive measures, ETC of switchyard equipments.

9) Erection, Testing, Commissioning of switchyard & transmission line.

4) Before LIS site visits the Electrical Engineer shall be made aware of the fact that in future LIS is to be operated either by Electrical or Mechanical Engineer. Therefore Engineer must be capable of handling all Electro-Mechanical subjects related to LIS.

9) Interrelated activities of Civil & Mechanical wing.

90) Operation & Maintenance of LIS.

99) Fault Mva calculation, Designing of Earth mat for Power House & Switchyard. Earthing requirements of Transformer and other equipments, Laying & Testing of Earth mat.

E) Small Hydro Project & Pre - post monsoon inspection of SHP--9week

9) Scenario of SHP in Maharashtra, India Policies and Programme in SHP Development in India and Maharashtra. Procedure and various stages involved in Allotment of SHP to Private Company, Preparation of TEFR & scrutiny of TEFR. Power Trading, Financing and Tariff Determination, Economics and Financial Analysis, Power Purchase Agreement, Role and Responsibility of GOMWRD and Promoter.

2) Privatisation policy & different clearances required, etc. Prescribed format / Procedure for Land Acquisition / Forest clearance. Railway, P. T. C.C. & Road Clearances for Transportation /

Erection of Transmission Line & its clearances. Safety precautions as per the Factory Act for power house. Factory Inspector clearances, Electrical Inspector clearances. MAHAGENCO / TRANSCO / MSEDCL / Clearances

3) Standard Operating Procedure (SOP) / Work Instructions for safe and effective operation of power house, Half yearly / yearly, overall maintenance of power house, taking readings of meters & maintaining the instruments of the power house & switchyard.

8) Inspection and testing of E& M equipments at factory & work site . (List of various tests of equipments is attached), Monitoring of Hydro projects & switchyard of LIS.

4) Inspection of Power House .Effective Testing & determination of derating of Power House & its need for RMU.

6) Instrumentation of dams, pre monsoon & post monsoon inspection.

F) Air conditioning, Fire Fighting system –2 week

1) Designing of Air Conditioning system for Power House, ETC & operation and Maintenance of AC system.

2) Designing of Fire Detection and Fire Hydrant protection system for power house and switch yard, Erection, Testing, Commissioning and setting up of Standard Operating procedures with respect to the periodical maintenance schedule.

3) Types of Electrical lifts, Selection of Lift for power house, ETC and O&M of Elect lifts.

8) Illumination and electrification of the power house, switchyard , D C lighting system

4) Solar Energy– planning, Power estimation , rules & regulation, layout of solar power project etc

6) National Hydro Policy. Central Electricity Authority Guide lines. Non– conventional Energy Sources.(MNRE schemes). Project Finance, MNRE subsidy. Issues regarding Power Grid Regulatory Authorities–CERC, MERC. National Tariff Policy.

9) Power Trading, Power purchase agreement.

9) Policies of State & Central Govt. regarding Solar Power.

G) IE Rule 2004 & Electricity Act 2003—9 week
<p>1) IE Rule 2004 & Electricity Act 2003</p> <p>2) General fire & Fire Fighting System, Insurance. Accidents, Legal & Procedures, Disaster Management.</p> <p>3) Need for safety to personnel and equipment,</p> <p>4) National Building Code of India Part 8 Fire and Safety.</p> <p>5) Importance of Energy audit, Rules & conduct of Energy audit.</p> <p>6) Personnel Safety, Equipment safety, Layout of Project considering Safety aspect.</p>
H) Estimate & tendering & gem—9 week
<p>1) Project Management. Administrative approval for the project, technical sanction. Estimate for the project & equipment. Tendering process, Preparation of DTP sanction of tender, Evaluation of tender, formation of contract agreement.</p> <p>2) Preparation of project report, Introduction to preparation of detailed estimates (original & revised), CSR, Precautions to be taken while preparing original estimates & revised estimates, Power to sanction of estimates & revised estimate.</p> <p>3) Indian Contract Act 1872, FIDIC Contracts Execution of work by department, various types of contract, rate list, A-1, A-2, B-1, B-2 , C , ICB, NCB & LCB etc Working in WRD, Tendering process, Preparation of DTP, sanction of tender,</p> <p>4) Various tender conditions/clauses, EMD, security deposit, preparation of RA bills & final bills, defect liabilities etc. Opening of tender, Tender evaluation & issue of work order, formation of contract agreement, claims, dispute, DRB, Arbitration.</p> <p>5) Various types of advances to the contractors, procedure of recovery of advances, tender notice, e- tendering & its procedure. Price escalation extra items extension of time limit of contracts etc.</p> <p>6) Importance of measurement book, issue of measurement book, precaution to be taken while recording measurement, powers of recording measurement, Percentage check by various Officers viz. JE-AE/DE/EE.</p>

9)E- GEM
l) Value education, ethics and moral, stress management – 9 week
<p>१) Personality development, Communication Skill, Writing And Drafting Stress management, Time management.</p> <p>२) Moral ethics and spiritual values, Organisation ethics.</p> <p>३) And related topics.</p>
J) E Jalsewa, E Governance – 9week
<p>१) Application of Technology like Remote sensing Geographical Information System, Bhuvan Portal, e -jalshruti etc.</p> <p>२) Application of CPM/PERT based Project Management Software.</p> <p>३) And related Topics</p>
K) Site visits –9 week
१) Visit to SHPs, HEPs, PSS, LIS etc.